FORM PTO-1390 (Modified) (REV 10-95) U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371

ATTORNEY'S DOCKET NUMBER: **AD-6705**

U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR): **09/890028**

INTERNATIONAL APPLICATION NO.	INTERNATIONAL FILING DATE	PRIORITY DATE CLAIMED
PCT/US00/04754	**25 FEBRUARY 2000 (25.02.00)**	**25 FEBRUARY 1999 (25.02.99)**

TITLE OF INVENTION
AQUEOUS DISPERSION COMPOSITION AND MANUFACTURING METHOD FOR THE COMPOSITION

APPLICANT(S) FOR DO/EO/US
NAKATA, Kazuyuki

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information

1. ☑ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☑ This is an express request to being national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b)) and PCT Articles 22 and 39(1).
4. ☑ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. ☑ A copy of the International Application was filed (35 U.S.C. 371 (c) (2))
   a. ☒ is transmitted herewith (required only if not transmitted by the International Bureau.
   b. ☐ has been transmitted by the International Bureau.
   c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US)
6. ☐ A translation of the International Application into English (35 U.S.C. 371 (c) (2)).
7. ☑ A copy of the International Search Report (PCT/ISA/210).
8. ☑ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371 (c) (3))
   a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
   b. ☐ have been transmitted by the International Bureau.
   c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
   d. ☒ have not been made and will not be made.
9. ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371 (c)(3)).
10. ☑ An oath or declaration of the inventor(s) (35 U.S.C. 371 (c)(4)).
11. ☑ A copy of the International Preliminary Examination Report (PCT/IPEA/409)
12. ☐ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371 (c)(5)).

Items 13 to 18 below concern document(s) or information included :

13. ☐ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
14. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
15. ☐ A FIRST preliminary amendment.
    A SECOND or SUBSEQUENT preliminary amendment.
16. ☐ A substitute specification.
17. ☑ A change of power of attorney and/or address letter.
18. ☑ Certificate of Mailing by Express Mail.
19. ☐ Other items or information:

17. General Power of Attorney
18. Express Mailing Label No.: EL031053745US

APPLICATION NO. (IF KNOWN, SEE 37 CFR)	INTERNATIONAL APPLICATION NO.	ATTORNEY'S DOCKET NUMBER
09/890028	PCT/US00/04754	AD-6705

20. The following fees are submitted

CALCULATIONS PTO USE ONLY

BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) – (5)) :

☑ Search Report has been prepared by the EPO or JPO	$860.00	
☐ International preliminary examination fee paid to USPTO (37 CFR 1.482)	$690.00	
☐ No international preliminary examination fee paid to USPTO (37 CFR 1.482) but international search fee paid to USPTO (37 CFR 1.445(a)(2))	$760.00	
☐ Neither international preliminary examination fee paid to USPTO (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO	$1000.00	
☐ International preliminary examination fee paid to USPTO (37 CFR 1.482) And all claims satisfied provisions of PCT Article 33(2)-(4)	$ 100.00	
ENTER APPROPRIATE BASIC FEE AMOUNT	=	**$860.00**
Surcharge of **$130.00** for furnishing the oath or declaration later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492 (e)).		**$0.00**

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE	
Total Claims	18 - 20 =	0	x $18.00	**$0.00**
Independent Claims	3 - 3 =	0	x $80.00	**$0.00**
Multiple Dependent Claims **(check if applicable)**			☒	**$270.00**
TOTAL OF ABOVE CALCULATIONS			=	**$270.00**
Reduction of ½ for filing by small entity, if applicable. Verified Small Entity Statement must also be filed (Note 37 CFR 1.9, 1.27, 1.28) **(check if applicable).**			☐	**$0.00**
SUBTOTAL			=	**$270.00**
Processing Fee of **$130.00** for furnishing the English translation later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492 (f)).				**$0.00**
TOTAL NATIONAL FEE			=	**$1,130.00**
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31) **(check if applicable).**			☐	**$0.00**
TOTAL FEES ENCLOSED			=	**$1,130.00**
			Amount to be : refunded	$
			Charged	$

☐ A check in the amount of _____ to cover the above fees enclosed.

☑ Please charge my Deposit Account No. **04-1928** in the amount of **$1,130.00** to cover the above fees.

☑ The Commissioner is hereby authorized to charge any fees which may be required, or credit any overpayment to Deposit Account No. **04-1928** a duplicate copy of this sheet is enclosed.

NOTE : Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (CFR 1.37(a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

EVANS, Craig H.
E. I. DU PONT DE NEMOURS AND COMPANY
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SIGNATURE

EVANS, CRAIG H.

NAME

31,825

REGISTRATION NUMBER

July 20, 2001

DATE

TITLE

AQUEOUS DISPERSION COMPOSITION AND MANUFACTURING METHOD FOR THE COMPOSITION

FIELD OF THE INVENTION

The present invention relates to an aqueous dispersion composition having good stability and dispersion properties and a process for making it by dispersing an ethylene-methacrylic acid copolymer in water using an amount of ammonia in excess of amount that would be needed to neutralize methacrylic acid. It also relates to the application of this aqueous dispersion in making coated substrates.

BACKGROUND OF THE INVENTION

Aqueous dispersion compositions of ethylene α,β-ethylenically unsaturated carboxylic acid copolymers such as ethylene-acrylic acid copolymer or ethylene-methacrylic acid copolymer are known and sold commercially. They can be easily made by dispersing the readily available ethylene acid copolymers in water using an alkali metal compound and are useful in various applications such as coating film. However, because the film coated with such dispersion compositions has a poor waterproofness, it cannot be used for applications requiring a film that is waterproof.

It is known that an ethylene-acrylic acid copolymer can be used as an excellent raw material for an aqueous dispersion composition obtained using ammonia as dispersion aide, see for example U.S. 3,674,896 and GB 2,269,822. Although it has been difficult to obtain an aqueous dispersion composition using ammonia alone, a film coated with such aqueous dispersion should have a good waterproofness since there is no alkali ion to absorb water.

GB 1,559,048 describes an aqueous dispersion of ethylene-methacrylic acid copolymer partially neutralized with sodium ions and optionally residual 90% with ammonium ions for coating substrates.

Uniformly dispersing ethylene-methacrylic acid copolymer in water using a mixture of ammonia and an alkali metal has been known to be difficult. Such aqueous dispersions of ethylene-methacrylic acid copolymer could be obtained by adding small amounts of a surfactant as a supplemental disperser. However, because the coated film using such dispersions have both poor waterproofness and bleed-out, causing contamination, it was not preferred.

An object of this invention is to find a way to use ammonia alone as a dispersion aide to make a uniform aqueous dispersion composition of an ethylene-methacrylic acid copolymer that is stable for a long time, that is has a

good shelf-life of say a year or more. Another object was to find a way to make a film (or other substrate) that when coated with such an aqueous dispersion would have good waterproofness.

SUMMARY OF THE INVENTION

Attempts to obtain such an aqueous dispersion of ethylene-methacrylic acid copolymer using ammonia in an amount equivalent to that of the carboxyl groups contained in an ethylene-methacrylic acid copolymer were unsuccessful in making uniform dispersions.

With continued research, it was found that a stable, uniform aqueous dispersion of ethylene-methacrylic acid copolymer could be obtained using an ethylene-methacrylic acid copolymer containing specific amounts of acid, and using ammonia in an amount greater than the amount of the carboxyl groups in the copolymer. It was also found that coating a film (or other substrate) with such an aqueous dispersion could make a waterproof, coated film (or other substrate).

The present invention, claiming priority to Japanese Patent Application No. Hei 11[1999]-48872 which is incorporated herein by reference, relates to a process for making a uniform aqueous dispersion of ethylene-methacrylic acid copolymer having good dispersion stability and to the aqueous dispersion made from such process. It also relates to a coated substrate such as a film that, when coated with the aqueous dispersion of the present invention, has good waterproof properties. It also relates to a laminate obtained by applying the above-mentioned aqueous dispersion composition on a substrate for coating and drying to form a coated substrate.

The stable, uniform aqueous dispersion of the present invention consists essentially of a dispersion of component (A), an ethylene-methacrylic acid copolymer containing 15-35 wt% of methacrylic acid, and component (B), ammonia in an amount required for neutralizing 110-150% of the carboxyl groups of component (A) in water. The ethylene-methacrylic acid copolymer preferably comprises 5-50 wt% of the dispersion and preferably has a melt flow rate of 50-2000 grams/10 minutes at 190°C/2160 gram load. Surfactants and the like are not needed and preferably are not used.

DETAILED DESCRIPTION OF THE INVENTION

"Consisting essentially of" means that the recited components are essential, while smaller amounts of other components may be present to the extent that they do not detract from the operability of the present invention.

"Copolymer" means polymers containing two or more monomers.

A stable, uniform ethylene acid-containing copolymer aqueous dispersion composition can be obtained by mixing selected ethylene methacrylic acid copolymer in water in the presence of an excess amount of ammonia.

The ethylene acid-containing copolymer aqueous dispersion of the present invention consists essentially of a dispersion of component (A), an ethylene-methacrylic acid copolymer containing 15-35 wt% of methacrylic acid as the ethylene acid-containing copolymer, in water in the presence of component (B), ammonia used as a basic component in an amount greater than the amount of the carboxyl groups of component (A).

Both good dispersion property and good dispersion stability can be obtained by using an excess of component (B) ammonia, particularly an amount sufficient for neutralizing 110-150% of the carboxyl groups of the above-mentioned acid-containing copolymer (A). The resulting aqueous dispersion can be coated onto a substrate, such as a film, to make a coated substrate, particularly a coated film, that is not susceptible to moisture accumulation and has a good waterproofness.

It is suitable for ethylene-methacrylic acid copolymer (A) to contain 15-35 wt% or alternatively 15-25 wt%, particularly 18-30 wt%, of an unsaturated carboxylic acid. In the case of using a copolymer containing an unsaturated carboxylic acid in an amount that is less than the above-mentioned range, it is difficult to obtain a composition having a good aqueous dispersion property. In the case of using a copolymer containing an unsaturated carboxylic acid in an amount that is more than the above-mentioned range, a stable dispersion composition cannot be obtained and both the waterproofness and mechanical strength of the coated film are reduced.

An ethylene-methacrylic acid copolymer having a melt flow rate of 50-2000 grams/10 minutes, particularly 60-1500, at 190°C/2160 gram load is suitable. In the case of using a methacrylic acid copolymer having an extremely low melt flow rate, an aqueous dispersion composition having a good dispersion property cannot be obtained. When using a copolymer having an excessively high melt flow rate, the coated film has a poor strength.

Besides ethylene and methacrylic acid, the copolymer may be copolymerized with other monomers including an unsaturated carboxylic acid ester such as methyl acrylate, ethyl acrylate, n-butyl acrylate, isobutyl acrylate, methyl methacrylate, isobutyl methacrylate, dimethyl maleate, or diethyl maleate; a vinyl ester such as vinyl acetate or vinyl propionate; and carbon monoxide, in an amount of 20 wt% or less, particularly 10 wt% or less.

The aqueous dispersion composition of the present invention contains ammonia, which can neutralize an excess, particularly 110-150%, more particularly 120-140% of the carboxyl groups of copolymer (A), along with copolymer (A).

In the case of an aqueous dispersion composition of the present invention containing a lower amount of ammonia than the above-mentioned range, a stable aqueous dispersion composition cannot be obtained. In the case of an aqueous dispersion composition of the present invention containing a higher amount of ammonia than the above-mentioned range, gelling easily occurs.

The aqueous dispersion composition suitably has the copolymer (A) present in an amount of 5-50 wt%, preferably 5-30 wt%, and particularly 10-30 wt%.

The aqueous dispersion composition is obtained by introducing both ethylene-methacrylic acid copolymer (A) and ammonia (B) with water into a vessel, then stirring them at about 90 to about 150°C for a sufficient time to uniformly disperse the ethylene-methacrylic acid copolymer (A), preferably about 10 minutes to about 2 hours.

The aqueous dispersion composition has good stability and good shelf life, such that neither the particle size nor the viscosity is significantly changed over times of up to a year or more.

Additives

A variety of additives can be added to the aqueous dispersion composition if desired.

Examples of additives include polyalcohols such as glycerin, ethylene glycol, polyethylene glycol, and polypropylene glycol; lower alcohols such as water-soluble epoxy compounds, methanol, ethanol, n-propanol, or isopropanol; ethers such as ethylene glycol monomethyl ether, ethylene glycol monoethyl ether, propylene glycol monomethyl ether, propylene glycol diethyl ether, diethylene glycol monoethyl ether, and dipropylene glycol monomethyl ether; esters such as propylene glycol monoacetate and ethylene glycol monoacetate; antioxidants; weather resistant stabilizers; ultraviolet-ray absorbents; antistatic agents; pigments; dyestuffs; antibacterial agents; lubricants; inorganic fillers; blocking preventing agents; and adhesives.

Other Polymer Aqueous Dispersion Compositions

The aqueous dispersion composition of the present invention may be mixed with other polymer aqueous dispersion compositions ("Other Dispersions") with a weight ratio based on the solid components in the dispersions of about 10/90 to about 90/10, particularly 20/80-80/20.

The Other Dispersion(s) with which the aqueous dispersion composition of the present invention may effectively be mixed should have a pH of 7 or more. If the pH of the Other Dispersion(s) is less than 7, it should be

adjusted with ammonia to obtain a pH of 7 or more before mixing. Also, the Other Dispersion should be one that is not gelled when it is mixed with the aqueous dispersion composition of the present invention. It is suitable to choose Other Dispersion(s) having an average particle size of 1-10000, preferably 1-1000, particularly 5-500 nanometers (nm), and having a solid component amount of 2-60 wt%, particularly 5-50 wt% of the dispersion. Preferably the particle size of the Other Dispersion(s) should be substantially the same as the dispersion of the present invention.

Examples of the Other Dispersion(s) include aqueous dispersions of ethylene-acrylic acid copolymer (particularly those made using ammonia alone as dispersing agent), polyvinyl acetate, ethylene-vinyl acetate copolymer, polyvinyl chloride, polyvinylidene chloride, water-soluble acryl resins, acrylamide resins, methacrylamide resins, acrylonitrile resins, styrene-acrylic acid copolymer, water-soluble polyurethane resins, water-soluble styrene-maleic acid copolymers, water-soluble polyurethane resins, styrene-butadiene copolymers, high-impact polystyrene resins, butadiene resins, polyester resins, acrylonitrile-butadiene copolymers, polyethylene resins, polyethylene oxide resins, polypropylene-ethylene copolymers, maleic anhydride graft-polypropylene-ethylene copolymers, polyethylene chloride, polypropylene chloride, EPDM (ethylene-propylene-diene polymer), polypropylene chloride, phenol resins, silicone resins, and epoxy resins. One or more types of these may be used.

A mixed aqueous dispersion composition can be obtained by stirring and mixing the two or more dispersion compositions at standard temperature. The base resin of the dispersion composition of the present invention may be melt-blended or dry-blended beforehand with the base resin of the other dispersion composition to be mixed with it, followed by dispersion in water. The present invention is not specifically restricted by any manufacturing method.

Coatings on Substrates

The aqueous dispersion composition of the present invention or mixed aqueous dispersion composition (aqueous dispersion composition of the present invention with Other Dispersion(s)) can be applied on any type of substrate as a coating. The coated substrate, particularly a coated film, made by this method has a good waterproofness.

The aqueous dispersions can be applied to a substrate for coating using a conventional method such as that using a roll coater or a bar coater, a method involving spraying, a method using an air-knife coater, a method using a

brush, or a method involving a substrate in the aqueous dispersion. Water is evaporated and a uniform film can be obtained by heating and drying after coating.

Examples of the substrate include molded products made by molding an olefin copolymer such as high, medium, or low-density polyethylene, ethylene-α-olefin copolymer, ethylene-vinyl acetate copolymer, ethylene-(meth)acrylic ester copolymer, ethylene-(meth)acrylic acid copolymer or ionomer, ethylene-(meth)acrylic acid-(meth)acrylic ester copolymer or ionomer, polypropylene, poly-1-butene, or poly-4-methyl-1-pentene; styrene resins such as polystyrene, ABS resin, or styrene-butadiene block copolymer; polyesters such as polyethylene terephthalate; polyamides such as nylon 6 or nylon 66; polyvinyl chloride; or their blends; natural materials such as a film, metal (iron, copper, aluminum, or stainless steel), wood, or paper; natural or synthetic leather; fibers such as nylon, polyester, acryl, urethane, or rayon; and fabrics.

The thickness of the coated film is not specifically restricted, but is suitably 1-20 micrometers (μm), particularly 1-5 μm. The coated film may be crosslinked by irradiating using an electron beam to improve the waterproofness or durability.

EXAMPLES

The following examples are illustrative of the present invention. All parts in the following examples are based on weight.

1. Raw materials and additives

The ethylene-methacrylic acid copolymers ("Copolymers") used in the examples are described in Table I. The ammonia used in the experiments was a 29% aqueous solution made by Kanto Kagaku K.K.

Table I

Composition		FR (dg/min)
Copolymer 1:	Ethylene/methacrylic acid (80 wt%/20 wt%)	60
Copolymer 2:	Ethylene/methacrylic acid (80 wt%/20 wt%)	300
Copolymer 3:	Ethylene/methacrylic acid (80 wt%/20 wt%)	500

2. Methods for evaluating the properties

Properties of the dispersions set forth in Table III were determined as follows:

1. Appearance: The measurement of Appearance of the resulting dispersions was by visual examination. The Appearance was considered to be
   a. "Uniform" if the dispersion contained no non-dispersed substances and remained stable for an extended period of time;
   b. "Non-uniform" if the dispersion contained non-dispersed substances or precipitates; and
   c. "Not dispersed" if the substances did not disperse or remain dispersed in the aqueous media.
2. pH: Based on JIS K6833. Obtained by measurement of a sample using a commercial pH meter Horiba Custany LAB "F12" pH meter.
3. Viscosity: Based on JIS K6833. Obtained by measurement using a single-cylinder rotary viscometer Synchro Lectric Viscometer.
4. Average Particle size: Measured by laser beam scattering-type particle size distribution measuring apparatus NICOMP 370HPL.

APPLICATION EXAMPLES 1-3

Copolymers, ammonia, and distilled water were introduced into an autoclave (300 mL) in the amounts shown in Table II, followed by stirring at 150°C for 60 minutes. The weight percent solid component in the aqueous mixture in each case was 25 wt%. Evaluation results for dispersion properties are shown in Table III.

COMPARATIVE EXAMPLES 1-4

Ammonia was used in the amounts shown in Table II in the same process used in Application Examples 1-3. Evaluation results for the dispersion property are shown in Table III.

Table II

Composition		
	Resin	Neutralization degree (NH_3) (%)
Application Example 1	Copolymer 1	130
Application Example 2	Copolymer 2	130
Application Example 3	Copolymer 3	130
Comparative Example 1	Copolymer 1	100
Comparative Example 2	Copolymer 2	100
Comparative Example 3	Copolymer 3	100
Comparative Example 4	Copolymer 1	75
Comparative Example 5	Copolymer 3	75

Table III

	Appearance	pH	Viscosity	Average particle size
Application Example 1	Uniform	11.1	225	53
Application Example 2	Uniform	11.1	400	22
Application Example 3	Uniform	11.0	705	24
Comparative Example 1	Not dispersed			
Comparative Example 2	Non-uniform	10.9	370	26
Comparative Example 3	Non-uniform	11.0	555	29
Comparative Example 4	Not dispersed			
Comparative Example 5	Not dispersed			

WHAT IS CLAIMED IS:

1. A stable, uniform, and alkali metal free aqueous dispersion consisting essentially of a dispersion in water of component (A), an ethylene-methacrylic acid copolymer containing 15-35 wt% methacrylic acid, and component (B), ammonia in an amount required for neutralizing 110-150% of the carboxyl groups of component (A).

2. The aqueous dispersion of claim 1 wherein the ethylene-methacrylic acid contains 18-30 wt% methacrylic acid.

3. The aqueous dispersion of claim 1 wherein the ethylene-methacrylic acid contains 15-25 wt% methacrylic acid.

4. The aqueous dispersion of claims 1, 2, or 3 wherein the ammonia is present in an amount sufficient to neutralize 120-140% of the carboxyl groups.

5. The aqueous dispersion of claim 1 wherein the ethylene-methacrylic acid copolymer comprises 5-50 wt% of the dispersion and preferably has a melt flow rate of 50-2000 grams/10 minutes at 190°C/2160 gram load.

6. The aqueous dispersion of claim 3 wherein the ethylene-methacrylic acid copolymer comprises 5-50 wt% of the dispersion and preferably has a melt flow rate of 50-2000 grams/10 minutes at 190°C/2160 gram load.

7. The aqueous dispersion of claim 4 wherein the ethylene-methacrylic acid copolymer has a melt flow rate of 60-1500 grams/10 minutes at 190°C/2160 gram load.

8. The aqueous dispersion of claim 5 wherein the ethylene-methacrylic acid copolymer has a melt flow rate of 60-1500 grams/10 minutes at 190°C/2160 gram load.

9. A coated substrate obtained by applying the aqueous dispersion of claim 1, 2 or 3 to the substrate for coating, then drying to form a coated substrate.

10. The coated substrate of claim 9 wherein the substrate is a film.

11. A process for making a stable, uniform, and alkali metal free aqueous dispersion of ethylene-methacrylic acid consisting essentially of mixing an ethylene-methacrylic acid copolymer containing 15-35 wt% methacrylic acid in water in the presence of sufficient ammonia to neutralize 110 to 150% of the carboxylic acid groups in the ethylene-methacrylic acid copolymer for a sufficient time to uniformly disperse the ethylene-methacrylic acid copolymer in the water.

12. The process of claim 11 wherein the mixing is carried out at a temperature of about 90 to about 150°C for about 10 minutes to about 2 hours.

GENERAL POWER OF ATTORNEY
(Concerning Several International Patent

The undersigned, Vernon R. Rice, Vice President and Assistant General Counsel of E. I. DU PONT DE NEMOURS AND COMPANY, 1007 Market Street, Wilmington, Delaware 19898 USA ("DuPont"), hereby confirms that the power to sign for DuPont has been granted to various individuals (as set forth in the attached excerpt from DuPont's Patent Board Rules of Procedure (January 1988), Appendix Section III.A.4), including the Chairman, Vice-Chairman, and those individuals who are Assistant Secretaries of the Patent Board. Currently these Assistant Secretaries are:

Roger A. Bowman	Barbara J. Massie
Linda J. Davis	Miriam D. Meconnahey
John E. Griffiths	Deborah A. Meginniss

In addition, the authority to act on behalf of DuPont before the competent International Authorities in connection with any and all international patent applications filed by it with the United States as Receiving Office and to make or receive payments on its behalf is hereby granted to:

Beardell, Lori Y.	34,293	Kuller, Mark D.	31,925
Belopolsky, Inna	43,319	Krukiel, Charles E.	27,344
Benjamin, Steven C.	36,087	Jarnholm, Arne R.	30,396
Birch, Linda D.	38,719	Langworthy, John A.	32,255
Bowen, Jr., Alanson G.	24,027	Lerman, Bart E.	31,897
Christenbury, Lynne M.	30,971	Levitt, Cary A.	31,848
Cotreau, William J.	36,490	Li, Kening	44,872
Deitch, Gerald E.	30,457	Magee, Thomas H.	27,355
Deshmukh, Sudhir	33,677	Mayer, Nancy S.	29,190
Dobson, Kevin S.	40,296	Medwick, George M.	27,456
Duffy, Roseanne R.	33,869	Morrissey, Bruce W.	30,663
Edwards, Mark A.	39,542	Reynolds, Stephen E.	37,580
Estrin, Barry	26,452	Rizzo, Thomas M.	41,272
Evans, Craig H.	31,825	Santopietro, Lois A.	36,264
Fair, Tamera L.	35,867	Schaeffer, Andrew L.	33,605
Feltham, S. Neil	36,506	Sebree, Chyrrea J.	45,348
Floyd, Linda Axamethy	33,692	Shafer, Robert J.	24,437
Frank, George A.	27,636	Shay, Lucas K.	34,724
Golian, Andrew G.	25,293	Shipley, James E.	32,003
Gorman, Thomas W.	31,959	Siegell, Barbara C.	30,684
Gould, David J.	25,338	Sinnott, Jessica M.	34,015
Griffiths, John E.	32,647	Steinberg, Michael A.	43,160
Hamby, Jane O.	32,872	Steinberg, Thomas W.	37,013
Hamby, William H.	31,521	Stevenson, Robert B.	26,039
Heiser, David E.	31,366	Strickland, Frederick D.	39,041
Hendrickson, John S.	30,847	Tessari, Joseph A.	32,177
Joung, J. Kenneth	41,881	Tulloch, Rebecca W.	36,297
Katz, Elliott A.	26,396	Walker, P. Michael	32,602
Kelly, Patricia L.	39,247	Wang, Chen	38,650
King, Karen K.	34,850		

The undersigned ratifies fully all actions already taken by the above-named individuals in accordance with the authority granted hereby.

E. I. DU PONT DE NEMOURS AND COMPANY

By: Vernon R. Rice

Vernon R. Rice
Vice President and Assistant General Counsel

Date: 9-13-00

Rev. 06/95

Docket Number
AD6705PCT

DECLARATION and POWER OF ATTORNEY

As a below-named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

AQUEOUS DISPERSION COMPOSITION AND MANUFACTURING METHOD FOR THE COMPOSITION

the specification of which is attached hereto unless the following box is checked:

■ was filed on **25 FEBRUARY 2000** as U.S. Application No. _____ orPCT International Application No. **PCT/US00/04754** and was amended on _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is known to me to be material to patentability as defined in 37 CFR § 1.56.

I hereby claim foreign priority benefits under 35 U.S.C. § 119(a)-(d) or § 365(b) of any foreign application(s) for patent or inventor's certificate, or § 365(a) of any PCT International application which designated at least one country other than the United States, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or PCT International application having a filing date before that of the application on which priority is claimed.

Application No.	Country	Filing Date	Priority Claimed (Yes/No)
JP48872/1999	JP	25 FEBRUARY 1999	Yes

I hereby claim the benefit under 35 U.S.C. § 119(e) of any United States Provisional Application(s) listed below.

U.S. Provisional Application No.	U.S. Filing Date

I hereby claim the benefit under 35 U.S.C. § 120 of any United States application(s), or § 365(c) of any PCT International Application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application or PCT International Application in the manner provided by the first paragraph of 35 U.S.C. § 112, I acknowledge the duty to disclose information which is known to me to be material to patentability as defined in 37 CFR § 1.56 which became available between the filing date of the prior application and the national or PCT International filing date of this application.

Application No.	Filing Date	Status (patented, pending or abandoned)

POWER OF ATTORNEY: I hereby appoint the following attorney(s) and/or agent(s) the power to prosecute this application and transact all business in the Patent and Trademark Office connected therewith:

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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

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